Fixed points for the nontrivial case $g_1^* \neq 0, \quad u_1^* \neq 0$

$$\beta_{g_1} = g_1(-y + 2\gamma_D - 2\gamma_v),$$

$$\beta_{g_2} = g_2(-\epsilon - \gamma_{g_2}),$$

$$\beta_{u_2} = -u_2\gamma_{u_2},$$

$$\beta_{u_1} = u_1(-\eta + \gamma_D),$$

$$\beta_a = -a\gamma_a,$$

anomalous dimensions

$$\begin{aligned}
\gamma_D &= \frac{g_1}{4(1+u_1)}\left[3 + \alpha\frac{u_1 - 1}{u_1 + 1} + \frac{4\alpha a(1-a)}{(1+u_1)^2}\right] + \frac{g_2}{8},\\
\gamma_a &= (1-2a)\left[\frac{g_1\alpha(1-a)}{2(1+u_1)^3} + \frac{g_1 u_2}{4a(1+u_1)}\left(3 + \alpha - \frac{2\alpha}{1+u_1}\right) + \frac{g_2}{8a}\right],\\
\gamma_{u_2} &= \frac{g_1(1-2u_2)}{4(1+u_1)}\left[3 + \alpha\frac{u_1 - 1}{u_1 + 1} + \frac{2\alpha a(1-a)}{u_2(1+u_1)^2}\right] - \frac{g_2}{8},\\
\gamma_{g_2} &= -\frac{3g_1}{2(1+u_1)} + \frac{g_1\alpha}{1+u_1}\left[\frac{(1-2a)^2}{2} + \frac{1-3a(1-a)}{1+u_1} + \frac{2a(1-a)u_1}{(1+u_1)^2}\right] - \frac{3g_2}{2},\\
\gamma_v &= \frac{g_1\alpha}{4(1+u_1)^2}\left[\frac{4a(1-a)}{1+u_1} - 1\right] + \frac{g_1 u_2}{2(1+u_1)}\left[3 + \frac{\alpha u_1}{1+u_1}\right].
\end{aligned}$$

Fixed points

- FP I

$$g_1{}^* = 0, \quad g_2^* = \frac{2\epsilon}{3} \wedge g_2^* = 8\eta, \quad u_1^* \text{ not fixed }, \quad a^* = \frac{1}{2}, \quad u_2^* = 0$$

- FP II

$$g_1{}^*, \quad g_2^* = 0, \quad u_1^*, \quad a^* = \frac{1}{2}, \quad u_2^*$$

equations to solve

$$\begin{aligned}
\eta &= \frac{g_1}{4(1+u_1)}\left(3 + \frac{\alpha u_1^2}{(1+u_1)^2}\right),\\
y &= \frac{g_1(1-2u_2)}{2(1+u_1)^2}\Bigg(3 + u_1(\alpha+3)\Bigg),\\
0 &= \alpha\Bigg(-1 + 4u_2 - 2u_1^2u_2 - 4u_2^2(1+u_1)\Bigg) - 6u_2(1+u_1)^2
\end{aligned}$$

- FP III

$$g_1{}^*, \quad g_2^*, \quad u_1^*, \quad a^* = \frac{1}{2}, \quad u_2^*$$

equations to solve

$$\begin{aligned}
y &= \frac{g_2}{4} + g_1(1-2u_2)\left(\frac{\alpha u_1}{2(1+u_1)^2} + \frac{3}{2(1+u_1)}\right), \\
\epsilon &= \frac{3g_2}{2} + g_1\left(-\frac{\alpha(1+3u_1)}{4(1+u_1)^3} + \frac{3}{2(1+u_1)}\right), \\
\eta &= \frac{g_2}{8} + \frac{g_1}{4(1+u_1)^3}\left(3(1+u_1)^2 + \alpha u_1^2\right), \\
0 &= \frac{g_2 u_2}{8} - \frac{g_1 u_2(1-2u_2)}{4(1+u_1)}\left(3 + \alpha\frac{u_1-1}{u_1+1} + \frac{2\alpha a(1-a)}{u_2(1+u_1)^2}\right)
\end{aligned}$$

- FP IV

$$g_1{}^*, \quad g_2^*, \quad u_1^*, \quad a^* \neq \frac{1}{2}, \quad u_2^* \neq \frac{1}{2}$$